

T. A. Leonard Barn
Old Moscow Highway
Pullman vicinity
Whitman County
Washington

HABS No. WA-168

HABS
WASH,
38-PULL.V,
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

REDUCED COPIES OF MEASURED DRAWINGS

Historic American Buildings Survey
National Park Service
Western Region
Department of the Interior
San Francisco, California 94102

HABS
WASH,
38-PULL.V,
1-

HISTORIC AMERICAN BUILDINGS SURVEY

STRUCTURE NAME:

T. A. Leonard Barn

HABS NUMBER:

WA-16B

LOCATION:

South Side of Old Moscow Highway, approximately 3 1/2 miles Southeast of Pullman, Pullman Vicinity, Whitman County, Washington.

U.S.G.S. Moscow West, Idaho - Washington Quad-range

Universal Transverse Mercator Coordinates:
11.490595.5172115

PRESENT OWNER:

Leonard Family Trust
A. Christine Leonard
7416 Saraview Way
Sebastapol, California 95472

PRESENT OCCUPANT:

Mrs. George M. (Jessie) Leonard
Box 253
Pullman, Washington 99163

PRESENT USE:

Agricultural Storage

SIGNIFICANCE:

The T.A. Leonard Barn is significant because it represents a period of agricultural development when farmers were experimenting with new production concepts and ideas to offset the rising demand of urbanization. The round barn form is a physical manifestation of the need and desire for a more convenient and efficient farming operation. Located on the eighty year-old family farm in the wheat-producing Palouse region, the Leonard Barn has remained relatively unchanged in its original form and rural context. It is one of two round barns remaining in Whitman County and one of ten remaining in Washington State.

PART I: HISTORICAL INFORMATION

A) Physical History

- 1) Date of Erection: March-June, 1917. From a statement prepared by George M. Leonard, on February 2, 1972. Xerox copy is possession of Mrs. George M. (Jessie) Leonard.

- 2) Architect:

Unknown. As is typical with vernacular architecture, there is no evidence of a specifically identified architect. Usually the builder altered existing "plans" to suit the owner's needs. There is evidence Leonard visited Max Steinke, who designed the other polygonal barns in Whitman County. He may have used Steinke's plans along with round barn plans published in farm periodicals.

- 3) Original and Subsequent Owners:

The following is an incomplete chain of title to the land on which the structure stands. The land is the East 1/2 of the N.E. 1/4 of Section 15, T. 14N. R. 45E. East of the Willamette Meridian. Reference is the Ticor Title Insurance Company, 409 North Main Street, Colfax, Washington 99111.

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|------|---|
| 1891 | Patent. January 23, 1891 recorded January 4, 1898 in Letter 4, Page 567. United States to William H. Robertson. |
| 1901 | Deed, October 30, 1901. Recorded November 2, 1901 in Book 101, Page 152. W. H. Robertson to J. W. Steans. |
| 1901 | Deed November 2, 1901. Recorded February 3, 1904 in Book 116. Page 483. J. W. Steans to L. B. Mitchell. |
| 1905 | Deed, September 11, 1905. Recorded November 13, 1905 in Book 127, Page 417. L. B. Mitchell to Grace S. Leonard (Sister). |
| 1907 | Deed August 15, 1907. Recorded January 4, 1908 in Book 143, Page 6. Grace S. Leonard to Byron O. Leonard (Brother). |
| 1909 | Deed January 29, 1909. Recorded February 10, 1909 in Book 153, Page 133. Byron D. Leonard to Thomas A. Leonard. |
| 1930 | Will written May 21, 1930, Probated August 25, 1931, P.C. #5429. Thomas A. Leonard to Sadie Alma Leonard (Wife). |
| 1943 | Will written May 16, 1938 with Codicil written November 22, 1943, probated October 27, 1944, P.C. #7810. Sadie Alma Leonard to Esther Hibbs (Daughter). |
| 1944 | Deed October 17, 1944, recorded October 27, 1944 in Book 259, Page 155, File #200250. Esther Hibbs to Oliver A. Leonard and George M. Leonard. |

- 1950 Deed, May 17, 1950, recorded June 2, 1950 in Book 280, Page 323, File #239229. George M. Leonard to Oliver A. Leonard.
- 1974 Deed February 8, 1974, recorded April 15, 1974 in Book 354, Page 455, File #419527. Oliver A. Leonard to A. Christine Leonard, Trustee.

4) Builders, Suppliers

- a) Builder: James H. Cline (from statement prepared by George M. Leonard on February 5, 1975. Confirmed by Esther Hibbs, T.A. Leonard's Daughter, in an interview on July 18, 1985.)

James H. Cline is listed as a carpenter in R. L. Polk's and Company 1904 Whitman County Directory. This is his earliest directory listing (Archives and Special Collections, in Holland Library, Washington State University). Cline is also listed in the May, 1917 but not the April, 1919 Pullman Telephone Directory.

- b) Suppliers: Potlatch Lumber Company, Potlatch, Idaho. (From a statement prepared by George M. Leonard, February 5, 1975)

B. Historical Context

"Round Barn" is a generic term used to describe barns with curved walls and circular plans, as well as multi-faceted or polygonal plans with five or more sides, which have a central form. The specific origin of the round barn is unknown, but is one of the many central form building types which have evolved over time. George Washington designed one of the first recorded round barns in North America. Built in 1796 on his farm in Fairfax County, Virginia, it was a sixteen-sided polygonal barn. The most famous round barn is the Shaker Round Barn near Hanover, Massachusetts. Built in 1826 and rebuilt in 1865 after it was destroyed by fire, the barn is ninety feet in diameter and circular in plan with a relatively flat roof, giving it a low profile. Used to house cattle, it's origin is thought to also be symbolic since the circle is the theme of Shaker culture.

The major interest in round barns occurred during the period 1880-1920, although at no time did it become more popular than the traditional, rectangular barn. The catalyst for round barn construction was research occurring at Mid-Western universities. In 1889, Franklin H. King of the University of Wisconsin, built a round barn and published it's plan in the Wisconsin Agricultural Experimental Station Seventh Annual Report. The University of Illinois's twenty acre Demonstration Dairy Farm, begun in 1908, became a major advocate of the round barn. With it's objective "to produce the largest amount of milk for the least possible cost," the farm built several round barns. Wilbur J. Fraser wrote an article in 1910 entitled "The Economy of the Round Barn," which was published in the University's Experiment Station Bulletin #143. Jumping on the bandwagon, many farm machinery companies, such as the

Louden Machinery Company, published barn plan catalogs which were similar to house plan books of today. The catalogs displayed various barn designs accompanied by a plan, perspective rendering and verbal description of the barn. For a small fee, a farmer could purchase "Complete working plans and specifications."

With the advent of the industrial revolution the farmer was required to shift from self-sufficiency to production for market. As a result, the farm had to become more efficient in order to make a profit. The round barn was heralded by its proponents as being both more efficient and convenient. (See listing of Advantages and Disadvantages in Appendix.) Its advantages were many; it enclosed more square feet per lineal length of wall, required thirty to fifty percent less material and was better lighted and ventilated. With the livestock facing inwards, feeding could be done from a central "core" area, while cleaning could occur along the exterior perimeter wall, with the aid of a litter carrier. The demise of the round barn was almost certainly caused by rising labor-costs coupled with a lack of skilled craftsmen, rendering it uneconomical to build.

During the round barn era at the turn of the twentieth century, five round barns were built in Whitman County. Of these five barns, the first one, c. 1910, was a "true-round" barn. Circular in plan and with a low profile, it resembled the Shaker Barn. The remaining four barns, built within three years of each other, are nearly identical in size, shape and construction techniques. All have a twelve-sided polygonal (dodecagonal) plan, sixty feet across, with a large, self-supported, wood-bent, segmented-domed, roof. Based on a radiating structural grid, the barn's construction is inherently complex requiring skilled craftsmen. The transfer of the forces from the unsupported roof to the exterior bearing wall also requires a keen understanding of engineering principles. The close relationship of the polygonal barns is readily apparent and can be traced back to the first polygonal barn (the other remaining round barn in Whitman County). Designed and built in 1915 by Max Steinke, a St. John area farmer, it became the prototype for the other polygonal barns. The roofs on all four barns are identical except for the dormers. The wood-bents for the two polygonal barns for the Hall brothers near Steptoe, Washington were pre-fabricated by the Home Lumber Company of Spokane and shipped to Steptoe by rail. Steinke is also credited with designing these two barns. The disproportionately large roofs, approximately three times as tall as the exterior bearing walls, give these four barns an architectural uniqueness from other round barns in the nation. For instance, of the 160 recorded round barns in Iowa, only one, the Peter Tonsfeldt Barn of LeMars, built 1919, is similar in form although it's plan and roof are circular and not segmented. (Soike, 1983)

Thomas Andrew Leonard, homesteader, farmer and school teacher immigrated to the Palouse region from his home state of Pennsylvania. Being a man who held a high regard for education, he settled in Pullman not only for the high quality farmland, but also to be near the college (now Washington State University.) As a result, all three of his children graduated from W.S.U. Leonard's reputation was that of a man who never made a bold or rash decision, but rather analyzed his situation thoroughly before making his decision. After his rectangular

barn burned, he decided to replace with a round barn similar to those he had viewed on his trips through the Mid-West and in farm periodicals. According to a statement prepared by George Leonard, the two major reasons he built a round barn was the advantages of feeding and cleaning the livestock as well as the better natural lighting it offered.

Evidence supports that Leonard used two main sources in "designing" his barn. The first source was farm periodicals containing round barn plans. The second source was Max Steinke whom Leonard visited to inspect his barn. The Leonard Barn, although closely related to the other three barns, has some significant differences. The major difference is in the lower exterior walls. The other polygonal barns had concrete walls, whereas Leonard used stud wall construction, which he penetrated with more windows for light. He hated the low, dark barns so prevalent at the time, so he also raised the ceiling to a greater height. Another difference is in the dormers. Leonard used low-gabled dormer for his loft doors, while the other barns had arched dormers. While a third floor was built above the hay-mow floor (c. 1960), the barn, originally built in 1917, retains its initial design character including the original green and white exterior paint job. (Leonard hated red barns.) Even today, the barn is a source of pride for the Leonard family. Involved with reroofing the original roof, T. A. Leonard's son, George, was instrumental in preserving the barn at the time of his death in the Fall of 1984.

Part II: ARCHITECTURE DESCRIPTION

A. General Statement:

1. Architectural Character: The Leonard Round Barn is an example of a twelve sided agricultural structure with a vaulted roof. It is one of the last round barns in Whitman County that remains in reasonable condition and has become a landmark for the people of the Palouse.

This building represents new concepts in barn planning such as a concern for natural lighting, wind resistance, and conservation of materials. It was also an expression of what certain agriculturists viewed as primary functional relationships.

2. Condition of the Fabric: While the structural members of the barn remain in good shape, (disregarding the missing cupola), the overall fabric shows much evidence of adaptive reuse and haphazard addition.

Concerning the deterioration of materials, little rot damage was found on the interior. Some rot was found on unpainted joists near the upper loft doors. Good maintenance has kept environmental damage to a minimum, but some attention is needed. About half the roof is now in bad condition.

B. Description of Exterior:

1. Overall Dimensions: The barn is laid out as a dodecagon in plan with a maximum width of 58'-1" in elevation. Height without the cupola is 45'-4".
2. Foundations: Concrete walls of the first floor have random size aggregate and are 8" thick. They extend up 3'-2" from the finished floor, except at the doors where no wall exists. The top of the wall is rough, but level.
3. Wall Construction: Exterior walls, 6-1/4" thick, are composed of two by six studs, approximately 2'-0" on center. One by six Douglas Fir shiplap siding, with a 5" exposure covers most of the exterior walls. They are painted green and trim is white.
4. Structural System, Framing: The polygonal plan of the first floor is framed in rough cut Douglas Fir timbers arranged in a radial fashion. Two main two by ten joists, approximately 8" apart bear on beams directly over each row of six by six columns. These radiate from the edge of the silo to the intersection of two sides. Between the double joists lie seven others, equally spaced. Full six by six beams span between each column and support the joists. This system is quite regular until accommodation is made for the vehicular passage through the barn. Full ten by ten columns and beams frame this area because of the increased spans and uneven loading.

The outside walls are full two by six studs, load bearing, with full six by six columns at the intersections. A single bottom plate is conventionally attached to the low concrete foundation wall using lag bolts. The top plate is functionally a tension ring to absorb outward thrust of the bents above. It is composed of three full two by six members stacked, overlapped at the intersections, and nailed together.

The upper loft space is framed by large curved bents that bear at the intersections of the walls and meet in a crossing at the top of the barn.

The bents are made up of full one by tens nailed together on edge. They are five boards thick, the outside edge being rounded while the inside edges appear as tangents to the curve. At the bottom connection, the bents are notched on the inside to prevent slippage off the top plate and at the columns they bear on.

Two by six lateral braces are placed horizontally approximately 6' feet on centers between the bents, and one by ten sheathing nailers are placed vertically between the braces. The number of nailers is reduced as the bents come together at the crossing.

The floor system on the second floor is tongue and groove, one by four Douglas Fir planking. It is arranged as a square in plan. Some diaphragm action is gained in this configuration. The upper two decks are the same material, but are linearly arranged. Some of the flooring on these floors is failing in punching shear because of the columns bearing on the deck alone with no structural support below.

The added floors are conventional platform light frame construction with random size columns, mostly four by six beams, and two by six joists.

5. Outside Features: On the South side of the building a provision was made for manure removal. The manure trolley track is supported on the outside of the structure by a full three by twelve beam. The beam is nailed to an exposed joist on one side, and by a freestanding timber column with braces on the other. The building features a Loudon manure carrier in front of the South entrance door, and once had a hexagonal ventilation cupola at the peak of the roof.

6. Openings:

- a. Doorways and Doors: Two 5'-6" by 10'-3" sliding barn doors are located on both the North elevation and the South elevation. They are constructed by two layers one by four tongue and groove Douglas Fir planking, vertical on the outside, horizontal on the inside. White one by four trim surrounds each green door. South door has one by four cross bracing. Each door slides to the outside and is supported at two points by rollers.

The upper loft doors on the East and West elevations are directly opposite each other. They are both of the same construction as the lower doors and have cross bracing. Each door was 12'-6" by 4'-9" originally and fully operable. Now they have been cut so the bottom half of each door may be separately opened.

- b. Windows: The windows are four over four, double hung with full two by four sills and headers. The window casements are actually the full two by six studs that frame them. Window tracks are made of thin Douglas Fir lath. Full one by four Douglas Fir trim surrounds each window. A 1 1/2" quarter round plus 1" rabbet trim is below each window sill.

7. Roof:

- a. Shape, Covering: The roof is a segmented ribbed vault with spaced sheathing and cedar shingles of 5" exposure. Two dormers with gable roofs have similar covering.
- b. Cornice, Eaves: The eaves flare out at the base in a bell shape with a 20" overhang. Shingles overhang all exposed structure and there are no gutters. White one by ten exposed Douglas Fir joists provide some degree of cornice ornament as does a white one by six fascia at the belt course level.
- c. Dormers, Cupola: Two dormers surround the upper loft doors. They are framed vertically from the outside edge of the walls and rise to a 15'-6" peak. The dormer roof pitch is approximately 5/12 and is framed with full one by twelves of Fir, 1'-4" O.C. Spaced sheathing and shingles are typical. The sides are covered in one by six Douglas Fir shiplap sheathing with 5" exposure and a one by twelve covers the respective belt course level.

C. Description of Interior

1. Floor Plans:

- a. First Floor: Entry through the South door relates directly to the main silo door, the 10' silo, the elevator, and the vehicle pass-through. A small pen is located in the left of this pie shaped room, and the main stall area entry is to the right. An additional entry/exist door is located on the North wall.
- b. Second Floor: This space is accessible only through the elevator opening or the loft doors. One quarter of the second floor is still full height loft space while the remaining has a lower ceiling suitable for chicken coops. These areas are accessible from either side of the open loft space.
- c. Third Floor: Stairs without railings from second floor provide access to this floor. Third floor is column obstructed chicken coop space. A ladder built onto the wall near the top of the stairs gives access to an unused fourth floor. Scaffolding above the silo then allows access to the crossing of the bents.

2. Flooring: First floor is rough slab on grade with slopes toward the stall drains. Small 6" high concrete stall partition bases exist. A rounded 4" floor of concrete around part of the silo was concluded to be the base for a larger grainery. On second, third and fourth, one by four tongue and groove is exposed and there is evidence of patching. In some areas around the perimeter of second floor, and on top of fourth, sawdust over hay insulation is found.
3. Wall and Ceiling Finish: Walls are generally covered with plywood and fibreboard scraps. Ceilings are all exposed joists.
4. Openings:
 - a. Doors: Most interior doors are one inch thick vertical Douglas Fir boards of varying width, reinforced with horizontals and diagonals of the same material. All interior doors are unfinished.
 - b. Windows: Interior window treatment is usually the wall material nailed to the stud that frames in the window. Windows were intended to light the entire first floor level with even and maximum natural light. Partitions installed later obstructed this somewhat.
5. Hardware: The barn's significant hardware includes a Loudon Litter Carrier and track circling the interior. A three-way switch at the South door provides track access externally as well as internally.

Unusual hinges and door throws on the silo doors were constructed of black painted steel.

Some heavy duty hinges, approximately two inches by eight inches were noted on remaining stall doors and on upper loft doors.

A large lag bolt with pulley is suspended from the crossing of the bents.

Loudon barn door rollers were used on the external sliding doors at the first floor level.
6. Ventilation: Natural convection currents provided ventilation from the lower story to the cupola. Fans piercing the silo and some upper story walls provided air circulation during chicken use. Two air ducts hanging from the first floor ceiling also provided convective ventilation.
7. Lighting: Conventional incandescent fixtures.
8. Plumbing: One outdoor sillcock was located inside the South access door, to the right. An overhead chicken watering system of 3/4" iron pipe is located on the second and third floors.

9. Special Interest: An elevator, consisting of a electric motor, a cable and spool, a three-way switch, and a steel braced, wooden platform, was added on later. Another steel-framed scaffolding device, based on the same principle as the elevator, provides access to the roof surface.

PART III: SOURCES OF INFORMATION

A) Original Architectural Drawings

None Found

B) Early Views

There are many snapshot views of the barn taken by family members through the years. All early views of the barn seen by the researchers are in the possession of Mrs. George M. (Jessie) Leonard.

C) Interviews

1. Jessie Leonard, interviewed at the family homestead at various times during the Summer of 1985. She is the wife of George M. Leonard who was the son of T. A. Leonard.
2. Esther Hibbs, interviewed at her home on Sands Road, Pullman, Washington July 24, 1985. She is the daughter of T. A. Leonard.
3. George Leonard Jr., interviewed at the family homestead currently owned by Mrs. George M. (Jessie) Leonard on July 26, 1985. He is the son of George M. Leonard and a grandson of T. A. Leonard.

D) Bibliography

Arthur, Eric and Whitney, Dudley. The Barn. Greenwich, Conn: New York Graphic Society Ltd., 1972.

Fraser, Wilbur J. The Round Barn, Circular no. 230. Urbana, Illinois: University of Illinois Agricultural Experiment Station. September 1918.

A systematic, complete report on agricultural aspects of round barn design with photos and drawings related to Illinois' round barns.

McKee, Harley J., Recording Historic Buildings. Historic American Buildings Survey. Washington, D.C.: U.S. Government Printing Office, 1970. 165 pp. The best methodological manual available on survey recording, conforming to HABS standards, complete with drawings and photographs.

O'Conner, James W. "Three Interesting Farm Groups on Long Island.: The Architectural Review. (old series vol. xxvii) vol. 10(4): 98-100, 1920

Price, H. Wayne. "The Round Barn in Illinois." Historic Illinois Vol. 5 No. 5, February 1983.

General history of round barns in Illinois and several examples with good photos, text, and some drawings.

Radford, William A. Radford's Practical Barn Plans. Chicago, Illinois: The Radford Architectural Co., 1909.

Sloane, Eric. An Age of Barns. New York, NY: Funk and Wagnalls. 1967.

Soike, Lowell J. Without Right Angles, The Round Barns of Iowa. Iowa State Historical Dept: Library of Congress Card Catalog No. 82-620046,. 1983.

A general but informative history of round barns in Iowa and a directory of historical information on existing barns, complete with descriptions and photographs.

Smith, L. S. and Milne, Robert. "Plans for Farm Buildings." Manitoba Agricultural College Bulletin 10: Winnipeg, Canada. May, 1913.

A "state of the art" bulletin for 1913 showing plan views of several designs with specifications. Several construction photographs and "how to do it" instructions are included.

Smith, L. S. "Barn Ventilation." Manitoba Agricultural College Bulletin 13. Winnipeg, Canada: 1914.

*Toor, Karen and Towner, Ron. The Hall Round Barn: Ethnoarchaeology in Whitman Co., Wa. Under supervision of Dr. Ackerman, Anthropology 536 Submitted May 23, 1983. Not published.

A detailed history of a twelve sided barn near Steptoe, Wa. complete with maps, construction dates, costs, photos, drawings and documented interviews.

*Weddell, Jim. Round Barns of the Palouse WSU Architecture Library Vertical File: Building Types, Round Barns Submitted 1977. Not published.

General history of several barns in Whitman County, Wa., with local history, photos, and pertinent.

*Weddell, Jim. Taped interview with Richard Hall. Tape in possession of Weddell, Pullman, Wa.

Wells, Wilson L. Barns in the USA. New York, NY. McGraw-Hill, 1976.

Wooley, John C. Farm Buildings New York, N.Y. McGraw-Hill, 1941.

*Items with an asterisk are also available through:

Tom J. Bartuska
School of Architecture
Washington State University
Pullman, Washington 99164-2220
(509) 335-5214

E) Likely Sources Not Yet Investigated

None Known

F) Supplemental Material

Advantages of the Round Barn Configuration

1. Uses less material than a rectangular barn.
20% less linear wall length for same square footage enclosed.
30% to 50% less material for same cubic footage enclosed.
2. More convenient for storing, feeding and cleaning.
3. Warmer: less surface area than a rectangular barn.
4. Easier to light and ventilate.
5. Uninterrupted storage space with self-supported roof.
6. Reduction of wind-load on side of barn. Can be built higher than a rectangular barn.
7. Permits the use of shorter structural members.
8. Wall or top plate acts as bottom chord. Floor beams needs only to support the floor, it need not function as a bottom chord for a roof truss.
9. Religious view, keeps the devil from hiding in the corner.

Disadvantages of the Round Barn Configuration

1. Difficulty in enlarging or making additions.
2. Difficulty in locating builders with the necessary experience.
 - a) Difficult to layout.
 - b) Unusual angles and joints.
3. Requires specialty-designed equipment.

4. High maintenance costs.
 - a) Expensive to roof.
5. Silo in center is difficult to fill.
6. Not as good of a windbreak for livestock out-of-doors.
7. Sheathing problems of roof.

PART IV. PROJECT INFORMATION

This project was undertaken by the Washington State Office of Archaeology and Historic Preservation during the summer of 1985 under the direction of David Hansen, Deputy State Historic Preservation Officer., and J. William Rudd, Director, School of Architecture, Washington State University. David Mark Burger, intern architect, and Steve Eric Nys, student architect, produced the written report and measured drawings; the barn was photographed by George Bedirian.